

FACT SHEET FOR STATE WASTE DISCHARGE PERMIT ST-7400
TWIN CITY FOODS, INC. – Stanwood Operations

GENERAL INFORMATION	
Facility Name and Address	TWIN CITY FOODS, Inc. – Stanwood Operations P.O. Box 669 10120 269 th Place NW Stanwood, WA 98292 Snohomish County
Type of Facility	Vegetable Processing and Cold Storage
SIC Code	2037
Water Body ID Number	WA-05-1010
Discharge Locations	#001: Groundwater via Land Treatment 597 acres located within the East ½ of S1, T31N, R3E W.M., South ½ S25, S36, T32N, R3E, W.M., Southwest ¼ of the Southwest ¼ S30, Southwest ¼ S31, T32N, of the Stillaguamish floodplain Latitude/Longitude of Treatment Facility: 48° 12' 55" N 122° 21' 47" W (Pump Station)
Contact at Facility	Mr. Mick Lovgreen (360) 629-2111 Dr. Rolf Skrinde, Ph.D., P.E., Mgr Corporate Environmental Affairs (425) 488-8723 rskrinde@seattleu.edu
Responsible Official	Mr. Mark Lervick, VP Operations (360) 629-2111

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INTRODUCTION

This fact sheet is a companion document to the draft State Waste Discharge Permit No. ST-7400. The Department of Ecology (the Department) is proposing to reissue this permit, which allows discharge of wastewater to ground via land application for a term of five (5) years. This fact sheet explains the nature of the discharge, the Department's decisions on limiting the pollutants in the waste water, and the regulatory and technical bases for those decisions and the permit requirements.

Washington State law (RCW 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. Regulations adopted by the state include procedures for issuing permits (Chapter 173-216 WAC) and water quality criteria for ground waters (Chapter 173-200 WAC). They also establish requirements which are to be included in the permit.

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The Stanwood Twin City Foods (TCF) plant, opened more than 60 years ago, was the first of many vegetable processing plants opened by Twin City Foods. TCF now has vegetable processing plants in Ellensburg, Washington; Prosser, Washington; Pasco, Washington; and Lake Odessa, Michigan. The Stanwood site also houses corporate headquarters. In addition, there are cold storage facilities in Arlington and Kennewick, Washington that store vegetables but do not engage in processing activities.

Effluent from the original canning operations discharged directly to the Stillaguamish River. As TCF grew in the 1950's and effluent volumes increased, they began irrigating onto adjacent farmland on a trial basis. The City of Stanwood built a lagoon system in the 1970's to treat municipal wastewater and the industrial wastewater from TCF; however, most of the TCF process and wastewater continued to be land applied. When the high discharge volumes of summer process wastewater from TCF proved to overload the Stanwood lagoon system, TCF began full-time land application of process and summer repack wastewater. They built an 8.4-million-gallon capacity lagoon to hold and store process wastewater.

Off-season repack wastewater previously discharged to the Stanwood WWTP. This practice ceased in 2000. TCF increased their land application practice and constructed an additional 8-million-gallon capacity lagoon to hold the repack water for winter storage.

Noncontact cooling water was discharged to the Stillaguamish River until 1998 when this discharge was converted to a closed loop system.

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INDUSTRIAL PROCESSES

The harvesting and processing of locally grown vegetables are seasonal, beginning with fresh peas in July. Processing consists of air cleaning, washing with water, blanching, grading, final inspection, and freezing. The frozen product is stored in 1,700-pound tote bins in cold storage warehouses until it can be repacked in smaller portions. Repacking of the frozen product occurs throughout the year. Wastewater is generated from the washing of the vegetables from the field, hydraulic conveyance within the facility, cooling water, processing, and repack clean-up activities. Repack operations occur year-round and are separate from processing operations. Fresh vegetable processing occurs concurrently during July and August for about 45 days.

Since the fire destroyed the old plant in 1997, corn has not been processed at this site. Presently, only peas are processed but other vegetables may be added in the future. Repack includes peas, beans, corn, and carrots.

TREATMENT PROCESSES

Wastewater is conveyed by a system of gutters located throughout the plant to sumps, through two six-inch lines. Sump pumps lift the wastewater to a fine mesh screening system. Solids are separated out of the process wastestream with a roto-shear screen system (screen within a screen - .020 inches). The removed solids are used by local farmers as animal feed.

The screened effluent gravity flows to one of the two storage lagoons prior to land application. Repack water flows to the lagoons for winter storage prior to land application during the spring prior to the next year's processing season.

The wastewater (including repack water) gravity flows two miles through two 15-inch lines to one of two holding and storage lagoons. A pumping station with one 100-horsepower and two 150-horsepower units pumps the water from the holding lagoon to the irrigation areas through an underground manifold system. Two pumps are generally used for the irrigation operation with the third used as a standby. The wastewater is distributed from the manifolds to the spray fields via seven spray guns.

The back parking lot, where vegetable trucks unload to the plant, drains to the lagoon system. The front portion of the parking lot drains to the City of Stanwood's storm drain system.

SPRAYFIELD AND DISTRIBUTION SYSTEM

The application land comprises about 800 acres of reclaimed farmland in the Stillaguamish floodplain of which about 597 acres are used for actual wastewater application. The site is about 2 miles south of the city. The area is divided into 24 fields. A system of dykes was constructed which is augmented by interconnecting deep ditches to drain the fields.

Tide gates are located at the end of each ditch to prevent saltwater intrusion during incoming tides. Much of the land is underlain by a system of tiles, which are located approximately eighteen inches to three feet deep and drain into the deep ditches.

An underground manifold system allows TCF personnel to rotate the irrigation application as needed, depending on the ability of the fields to accept wastewater and crop needs.

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The application field is seeded in a pasture mix developed for use in the area as a good cattle food. The primary species making up this mix are Timothy, fescue, rye, and orchard grass. About 3-5 mowings occur per irrigation season. The fields are tilled and reseeded every 5-8 years.

The sprayfield area is also used intermittently for dairy waste application, with about 300 acres being used each year for dairy waste disposal. The Lervick Dairy Farm operations ceased in 2001 and those at the Quant Dairy were substantially reduced.

The amount of nitrogen produced per year at the dairy calculates out to about 34,000 pounds. Subtracting out 30% lost in storage in the dairy lagoon and 25% lost by volatilization during land application, and 30% loss from soil denitrification equals about 12,500 pounds of nitrogen remaining. Dividing this over the 430 acres used per year for dairy application (some land doesn't belong to TCF) equals about 29 pounds per acre per year of dairy waste. Taking the 29 pounds per acre and adding the TCF wastewater nitrogen (for the 300 acres that the wastes are commingled) equals about 68-70 pounds of nitrogen per acre for those 300 acres. The crop uptake is about 250 pounds per acre per year. The nitrogen limit for TCF was, therefore, set at 100 pounds per acre to protect the groundwater standard for nitrogen of 3 mg/L.

GROUND WATER

Because of the drain tiles located throughout the application fields at a depth of eighteen inches to three feet, and the proximity of surface water drainage to the ground surface, groundwater monitoring wells are not required. Instead, close attention to application rates, nutrient uptake, soil and wastewater monitoring, and surface water monitoring is included in this permit. The groundwater and marine surface water pH standard of 6.5 to 8.5 standard units is listed in the permit.

PERMIT STATUS

The previous permit for this facility was issued on June 22, 2000, and placed interim limitations on flow, BOD, and pH for discharges to the City of Stanwood WWTP. Limitations for flow, total nitrogen, and pH were placed on land application discharges. The permit was modified December 12, 2003, to remove TKN monitoring from the surface water locations and add fecal coliform monitoring.

An application for permit renewal was submitted to the Department on October 8, 2004, and accepted by the Department on October 12, 2004.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received an inspection on August 7, 2003. They were in full compliance with their permit at that time.

During the history of the previous permit, the Permittee has remained in compliance based on Discharge Monitoring Reports (DMRs) and other reports submitted to the Department and inspections conducted by the Department.

WASTEWATER CHARACTERIZATION

The concentration of flow volumes and pollutants was summarized from the 2003 and 2004 Annual Reports. The raw wastewater discharge is characterized for the following parameters:

Table 1: Process/Repack Wastewater Characterization (July - August samples)

Parameter	2003	2004
Flow (process water)	24.7	35.2 MG
Flow (repack water)	13.2	18.1 MG
Total Seasonal Flow	37.9 MG	53.3 MG
NO ₃ + NO ₂ -N (mg/L)	0.3	0.44
TKN (mg/L)	85	113.20
Magnesium (Mg) (mg/L)	23.1*	25*
Calcium (Ca) (mg/L)	30*	32*
Sodium (Na) (mg/L)	400*	41*
Total Phosphorous as P (mg/L)	3.9*	3.3*
Chloride (Cl) (mg/L)	602*	84*
TDS (mg/L)	2,946	2,040*
pH (standard units)	8.1	7.25
Conductance (µmhos/cm)	3,380	808*

* indicates based on one sample only

Nitrogen loadings to the land application fields are reported in the Annual Reports. Dairy waste applications are included in the calculations. Nitrogen loadings to the fields were within permit limits.

PROPOSED PERMIT LIMITATIONS

State regulations require that limitations set forth in a waste discharge permit must be either technology-based, water quality-based, or based on the effects of the pollutants to the POTW (local limits). Waste water must be treated using all known, available, and reasonable methods of treatment (AKART) and not pollute the waters of the state. The minimum requirements to demonstrate compliance with the AKART standard were determined in the engineering report and the annual submittal of irrigation and crop management plans that show nutrient loading relative to agronomic rates.

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The permit also includes limitations on the quantity and quality of the waste water applied to the spray field that have been determined to protect the quality of the ground water and surface water. The Department developed specific land application design criteria for this facility in the last permit. Water quality-based limitations are based upon compliance with the Ground Water Quality Standards (Chapter 173-200 WAC) and were determined by modeling the wastewater and land application site.

Technology-based limitations are based on the agronomic rates of the crop system (crop uptake) and any treatment capabilities of the soils (e.g., denitrification, nitrification). The treatment capacity of the sprayfields changes almost yearly as the type of crops are rotated, the amount of each crop that is grown changes, and the dairy waste application changes. The production-based limits for TSS and BOD listed in 40 CFR 407 Subpart G - *Canned and Preserved Vegetables* are less stringent than the agronomic requirements of this permit and therefore are not listed.

The more stringent of the water quality-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All waste discharge permits issued by the Department must specify conditions requiring available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). The following permit limitations are necessary to satisfy the requirement for AKART:

1. Waste water shall be land applied via spray irrigation at agronomic rates for total nitrogen and water, and at rates for other wastewater constituents that are protective of background ground water quality.
2. Total nitrogen and water shall be applied to the spray fields as determined by a current irrigation and crop management plan.
3. The system must be operated so as to protect the existing and future beneficial uses of the ground water and not cause a violation of the ground water standards.

GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the ground water quality standards.

The discharges authorized by this proposed permit are not expected to interfere with beneficial uses of ground water or surface water. Flow limits and requirements based on protecting the ground water are established through modeling and agronomic uptake calculations for the application site.

The nitrogen contribution to the TCF fields totaled about 58 pounds of nitrogen per acre (TCF Engineering Report, September 2004). Since the grass mixture TCF uses removes about 250 pounds/N/acre/year, and as confirmed by the crop analysis, the applied nitrogen is being removed via the crops. The total process wastewater and repack contribution from TCF is expected to be well below the 100 pounds/acre/year limit imposed in the permit to protect the groundwater standard for nitrogen of 3 mg/L.

COMPARISON OF LIMITATIONS WITH THE EXISTING PERMIT

Table 2: Comparison of Previous and New Limits

Parameter	Existing Limits	Proposed Limits
Flow	2.49 mgd max. to fields 19 inches/acre/yr. on fields	2.49 mgd max. to fields 19 inches/acre/yr. on fields
Total Nitrogen (to fields)	100 pounds/acre/year	100 pounds/acre/year
pH	Between the range of 6.5 - 8.5 standard units	Between the range of 6.5 - 8.5 standard units

The proposed permit describes outfall #001 as the process wastewater discharge from the lagoon onto land via spray irrigation.

The limits for hydraulic loading rate based on soil permeability were calculated using methods described in the EPA publication Land Treatment of Municipal Wastewater (1981). The TCF hydraulic loading limits were computed using evapo-transpiration values for pasture grass at Stanwood and soil permeability's based on Soil Conservation Service data.

The maximum land application rates based on nitrogen loading limits were also calculated using methods described in EPA, Land Treatment of Municipal Wastewater (1981). The calculated allowable loading based on nitrogen limits, crop uptake, dairy over-application, and estimated nitrogen removal of 55% by volatilization and denitrification (based on Snohomish Conservation District supplied NRCS spreadsheet) is 100 pounds of nitrogen per acre per year from TCF wastewater. The proposed loading at TCF falls within the EPA recommended limits for nitrogen loading.

The authority to implement storm water requirements is contained in Title 40 Subpart 122.22, and Title 33 of the Federal Water Pollution Control Act.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that groundwater criteria are not violated, and that effluent limitations are being achieved (WAC 173-216-110).

PROCESS WASTEWATER MONITORING

The monitoring schedule is detailed in the proposed permit under Special Condition S2.A. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. Flow monitoring occurs on process wastewater and repack water 12 months out of the year. This permit requires submitting total inflow water to the facility and then a calculation of what wastewaters are discharging to the lagoon(s). The permit will be reopened or a compliance schedule instituted if the Department feels this method does not adequately characterize flow values to the sprayfields.

SURFACE WATER MONITORING

The Permittee is required in Special Condition S2.C of the proposed permit to collect surface water samples from selected stations in the drainage ditch network adjacent to the application fields. Four sets of ditch samples are taken at each station each year: one preseason, two during the processing season, and one postseason. An upgradient station (Station 5) has been identified as the control sample station.

The monitoring information is used to monitor water quality impacts of the sprayfield application activities and may result in a permit modification or limits in the next renewal.

Surface water monitoring stations were set up because viable groundwater sampling was not feasible with the drain tiles in the application field. The goal of surface water monitoring is to follow and detect trends in water quality in the ditches receiving runoff or filtered water from the sprayfield area.

SOIL MONITORING

Soil monitoring will be required to help determine whether or not nutrients and salts are being flushed beyond the root zone, and to help determine nutrient loading and supplemental fertilization rates, if needed. Healthy soils are needed for healthy crops. Results of the soil monitoring will be reported in the annual Irrigation and Crop Management Plan.

CROP MONITORING

Crop monitoring will be required to help determine the uptake of nutrients (treatment) by the cover crops. Values will be reported in the annual Irrigation and Crop Management Plan, and will be used for determining the nutrient balance of the system.

OTHER PERMIT CONDITIONS

REPORTING AND RECORD KEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-216-110).

LAGOON LOADING

The design criteria for the storage lagoons are for approximately 8.4-million-gallon capacity and 8-million-gallon capacity. The older lagoon is sealed with natural clays (per the 1999 Engineering Report). The newer 8-million-gallon capacity lagoon, built in 2001, is lined with HDPE geosynthetic liner. Both ponds will be used as holding ponds and winter storage of repack water.

IRRIGATION AND CROP MANAGEMENT PLAN

The Irrigation and Crop Management Plan is required to support the engineering report(s) and Operations and Maintenance Manual. This plan shall include a consideration of wastewater application at agronomic rates and should describe and evaluate various irrigation controls.

OPERATIONS AND MAINTENANCE

The proposed permit contains Condition S4 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

SOLID WASTE PLAN

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste.

This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee update the Solid Waste Plan designed to prevent solid waste from causing pollution of the waters of the state and submit any plan revisions to the Department.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to ground water permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending, or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes, or regulations. Conditions G7 and G8 relate to permit renewal and transfer. Condition G9 requires the payment of permit fees. Condition G10 describes the penalties for violating permit conditions.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, and to protect human health and the beneficial uses of waters of the state of Washington. The Department proposes that the permit be issued for a term of five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Engineering Report Summary, May 1992 and September 2004.

Permit Application, Received October 8, 2004.

Twin City Foods, Annual Reports, 1997 -2004.

Washington State Department of Ecology, 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.

Washington State Department of Ecology, 1996. Implementation Guidance for the Ground Water Quality Standards, Publication #96-02, 135 pp.

Washington State Department of Ecology, 1995. Irrigation Management Practices to Protect Ground Water and Surface Water Quality, State of Washington.

Washington State University, November 1981. Laboratory Procedures - Soil Testing Laboratory. 38 pp.

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the Twin City Foods - Stanwood facility, listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Since there are no significant changes to the renewed permit, no public notification was required.

This permit and fact sheet were written by Lori LeVander.

APPENDIX B—GLOSSARY

Agronomic Rate—The rate at which a viable crop can be maintained and there is a minimal leaching of chemicals downwards below the root zone. Crops should be managed for maximum nutrient uptake when used for wastewater treatment (Ecology, 1996).

Ambient Water Quality—The existing environmental condition of the water in a receiving water body.

Average Monthly Discharge Limitation—The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)—Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural, and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅—Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass—The intentional diversion of waste streams from any portion of the collection or treatment facility.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Engineering Report—A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Grab Sample—A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial Wastewater—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Maximum Daily Discharge Limitation—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

pH—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Soil Scientist—An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5, 3, or 1 year(s), respectively, of professional experience working in the area of agronomy, crops, or soils.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface waterbody or a constructed infiltration facility.

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)—Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit—A limit on the concentration of an effluent parameter that is intended to prevent pollution of the receiving water.